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New species of *Pseudosinella* and *Lepidocyrtus* from Navarra (Northern Iberian Peninsula)

(Insecta: Collembola: Entomobryidae)

By **J. I. Arbea and R. Jordana**

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Two blind *Pseudosinella, P. pseudodecepta,* spec. nov. and *P. helenae,* spec. nov., that belong to the genealogical line of *Lepidocyrtus pallidus* Reuter, 1890, and *Lepidocyrtus tellecheae,* spec. nov., related to *Lepidocyrtus lignorum* Fabricius, 1775, are described an figured.

J. I. Arbea, R. Jordana, Department of Zoology, University of Navarra, Pamplona, Spain.

Introduction

In this paper we describe two new blind species of *Pseudosinella* Schäffer, 1897 and a new species of *Lepidocyrtus* Bourlet, 1839. The latter had been cited by Arbea and Jordana (1985) as *Lepidocyrtus* gr. *lignorum* I.

The types of these species are deposited in the Museum of Zoology, University of Navarra, and some paratypes in der Zoologischen Staatssammlung München.

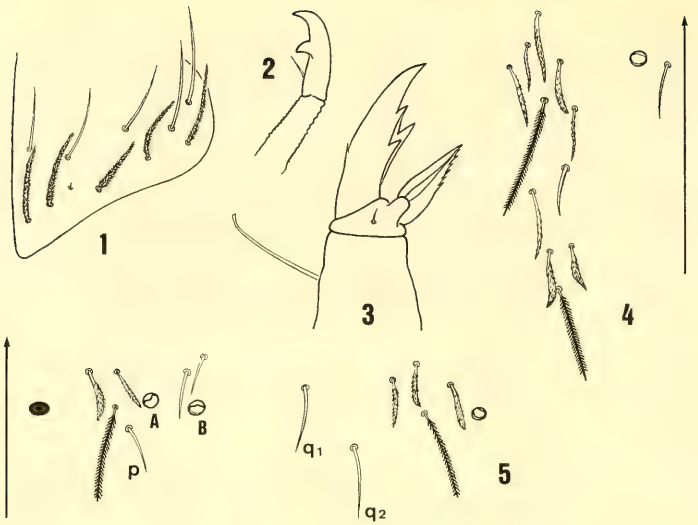
Pseudosinella pseudodecepta, spec. nov.

Figs 1–5

Material examined. Holotype: Bigüezal (Navarra, Spain), 1 160 m (U. T. M. 30TXN20), humus from grass land, 27.IV.1982. – Paratypes: Same data, 1 specimen. Valle de Arce, Zazpe, Monte Gurpegui, 620 m (U. T. M. 30TXN34), humus from 32 year old pine grove: 21.V.86, 2 specimens and 3.XI.86, 6 specimens. Valle de Lónguida, Jaberri, 590 m (U. T. M. 30TXN33), humus from a 22 y. o. pine grove: 23.VI.86, 1 specimen and 10.XI.86, 9 specimens. Añorbe, humus from bush land, 5.XII.86, 1 specimen. Añorbe, Monte San Martín, 630 m (U. T. M. 30TXNO2), humus from 47 y. o. pine grove, 1 specimen. Val de Aibar, Eslava, Monte los Fayales, 825 m (U. T. M. 30TXN21), 1 specimen. All localities from Navarra.

Description

Length 0.80–1.00 mm. Without eyes nor pigment. Antennae without scales. Antenna/cephalic diagonal ratio = 1.20–1.40. Dorsal macrochaetae chaetotaxy: R011/20/0201+2. Abdominal tergite II chaetotaxy: *p A B q1 q2* (Fig. 5). *s* seta on abdominal tergite IV present (Fig. 4). Labial chaetotaxy *M1 M2 r E L1 L2; r* vestigial, other setae ciliated (Fig. 1). Unguis with 3 inner teeth and 2 lateral ones;



Figs 1–5. *Pseudosinella pseudodecepta*, spec. nov. 1. Labial chaetotaxy. 2. Mucro. 3. Hind foot complex. 4. Chaetotaxy of the abdominal tergite IV. 5. Chaetotaxy of the abdominal tergite II.

the proximal unpaired tooth situated about 65–70% on inner margin of unguis. Inner anterior basal tooth more basal and less developed than posterior basal one (Fig. 3). Unguiculus lanceolated, reaching to proximal unpaired tooth; outer lamella with several small denticles. Tibiotarsal tenent hair truncated. Tenaculum with 4 + 4 teeth and a ciliate seta on corpus. Furca well developed; mucro with 2 teeth and a basal spine (Fig. 2).

Affinities. The formula 0211212 can be assigned to *P. pseudodecepta* spec. nov. according to the system proposed by Christiansen et al. (1983). Other members of the genus with this formula are *P. bidenticulata* Barra, 1967, *P. decepta* Gisin & Gama, 1969, and *P. recipiens* Gisin, 1967. *Pseudosinella bidenticulata* and *P. recipiens* differ from the new species by the cephalic chaetotaxy (R111), and by the number of macrochaetae on the thoracic tergites II and III (1–0 in *P. bidenticulata* and 4–2 in *P. recipiens).*

Pseudosinella pseudodecepta spec. nov. has the same dorsal macrochaetae chaetotaxy as in *P. decepta,* which is also blind. Refering to the phylogenetic tree proposed by Gama (1984), they differ in the fundamental chaetotaxy: *P. decepta* does not have the *p* seta on the abdominal tergite II, while the ciliate *R* seta is present on the labium (this character belongs to a derivative line from *Lepidocyrtus pseudosinelloides* Gisin, 1967); and *P. pseudodecepta* spec. nov. has the *p* seta on the abdominal tergite II, and the *r* on the labium is vestigial (this character belongs to a derivative line from *Lepidocyrtus pallidus* Reuter, 1890). According to Gama (1984), *P. pseudodecepta* spec. nov. has four non adaptative characters (evolutive steps) among the derived species from *Lepidocyrtus pallidus:* (1–2) Macrochaetae chaetotaxy on the thoracic tergites II and III is 2–0 (steps *g1* and *g3*), (3) *A* is macrochaeta on abdominal tergite II, and (4) *s* is present on the abdominal tergite IV.

The new species could be placed in the phylogenetic line going from *P. picta* and *P. zygophora* to *P. illiciens* as in the following scheme:

Evolutive steps

0	1	2	3	4	5
--------- *g1* --------	* --------- *A* --------	* --------- *s* ---------	* -------- *g3* -------	* --------- *g5* --------	* --
	picta	*apuanica*	*alba*	*pseudodecepta*	*illiciens*
	zygophora			spec. nov.	

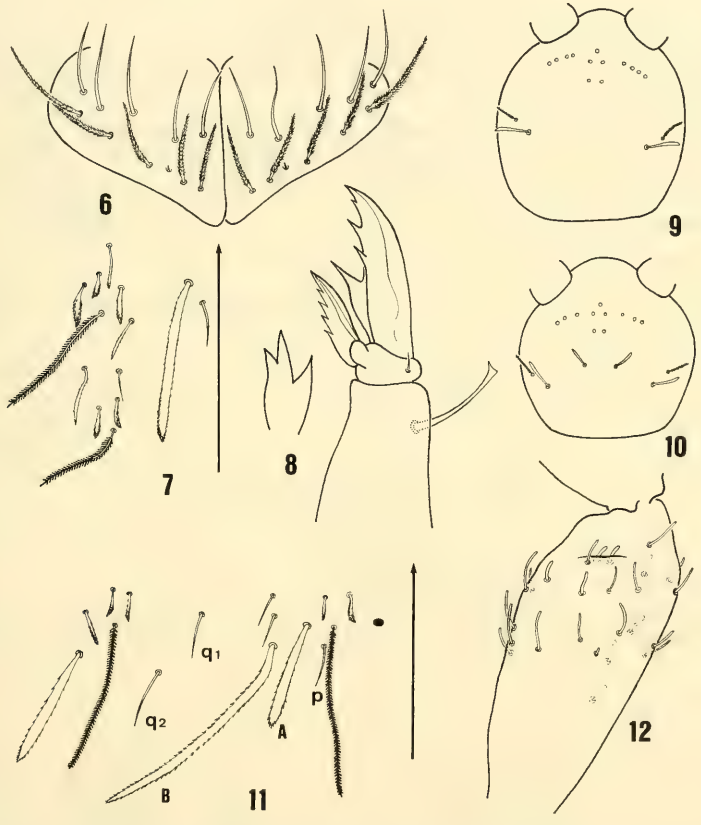
The new species is closely related to *P. illiciens* Gisin. 1967 from Italy. The only difference justifying species separation is the number of macrochaetae on thoracic tergites II and III (3–1 in *P. illiciens* and 2–0 in *P. pseudodecepta* spec. nov.).

Pseudosinella helenae, spec. nov.

Figs 6–12

Material examined. Holotype: Bardenas, near Caparroso Village (Navarra, Spain), 320 m (U. T. M. 30TXM18), mediterranean bush land (Rosmarino-Ericion), Humus, 1.III.1983. – Paratypes: 3 specimens from same locality and habitat and 2 specimens from humus *(Pinus halepensis)*.

Additional material: Same locality as holotype but in pine grove (Pinus halepensis). Humus, 20.VII.1982, 5 specimens; Humus, 27.X.1982, 8 specimens.



Figs 6–12. *Pseudosinella helenae*, spec. nov. 6. Labial chaetotaxy. 7. Chaetotaxy of the abdominal tergite IV. 8. Hind foot complex. 9. Characteristic dorsal chaetotaxy of the head in an adult specimen. 10. Dorsal chaetotaxy of the head in a juvenile specimen. 11. Chaetotaxy of the abdominal tergite II. 12. Sensillae chaetotaxy of the antennal segment III.

Description

Length 0.8–1.3 mm. Blind and without pigment. Antennae without scales. Antenna/cephalic diagonal ratio = 1.16–1.40. Antennal organ III consists of 2 subcylindrical, broad sensory rods, and 2 very thin "guard sensillae". This segment bears a variable number of these two types of sensillae

(Fig. 12). Dorsal macrochaetae chaetotaxy R001/21/0201+2. Abdominal tergite II chaetotaxy *p A B* q_1 q_2 (Fig. 11). The *s* seta on abdominal tergite IV is present (Fig. 7). Labial chaetotaxy *M1 M2 r E L1 L2; r* is vestigial, other setae ciliated (Fig. 6). Inner margin of unguis with a pair of basal teeth, proximal unpaired tooth, and a small distal tooth (Fig. 8). The proximal tooth is placed about 75–80% on the inner margin of unguis. The posterior basal tooth is more basal and more developed than anterior basal one. Unguiculus lanceolate, it almost reaches the tip of the anterior basal tooth. Outer lamella strongly serrated, with 4–5 denticles. Tibiotarsal tenent hair strongly clavate. Tenaculum with 4+4 teeth and a ciliate seta on the corpus. Mucro with 2 teeth and a basal spine.

There are some variations in cephalic chaetotaxy and presence of *s* seta on abdominal tergite IV in juvenile forms. Three specimens (0.60–0.65 mm length) have a cephalic chaetotaxy R011 (Fig. 10) and the *s* seta on abdominal tergite IV absent. In these specimens there is a number reduction in the number of microchaetae associated to the trichobothria: seta *mp* on abdominal tergite IV is absent and there are less microchaetae near of trichobothrium on abdominal tergite II than in adults.

Affinities. The formula 0221212 can be assigned to *P. helenae,* spec. nov. according to the system proposed by Christiansen et al. (1983). The new species is shared with *P. aeolica* Dallai, 1973, and may be derived from *Lepidocyrtus pallidus* (because of the *p* seta on the abdominal tergite II that it is present and r seta on labial basis that it is vestigial).

Refering to the phylogenetical tree proposed by Gama (1984), *P. helenae* has the following characters: (1) Cephalic chaetotaxy R001 *(f1);* (2) *s* seta on abdominal tergite IV; (3) *A* seta on abdominal tergite II as a macrochaeta; (4) macrochaetae chaetotaxy on the thoracic tergites II and III. Gama (1984) accepts the following steps:

g1 = 1–0; g2 = 1–1; g3 = 2–0; g4 = 2–2; g5 = 3–1

In *Pseudosinella helenae,* spec. nov. the thoracic macrochaetae chaetotaxy is 2–1, for that we ought to propose a new step: g3′ = 2–1.

Among the blind species, the most closely related ones are *P. anderseni* Gisin, 1967 and *P. aeolica;* both are different from *P. helenae* by thoracic chaetotaxy (1–0 in *P. anderseni,* 3–1 in *P. aeolica* and 2–1 in new species).

Lepidocyrtus tellecheae, spec. nov.

(Figs 13–18)

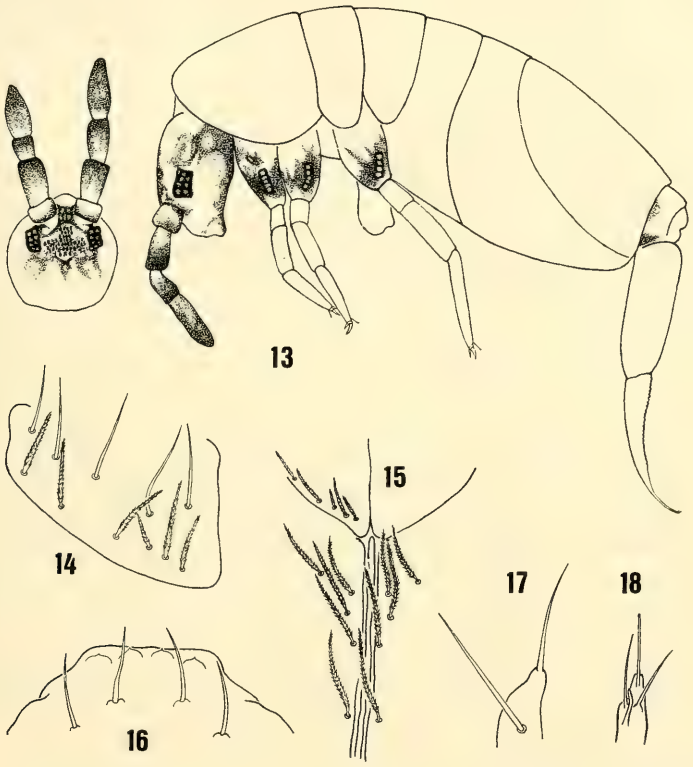
= *Lepidocyrtus* gr. *lignorum* I: Arbea and Jordana, 1985

Material examined. Holotype: Beunza (Navarra, Spain), 600 m (U. T. M. 30TXN05), oak forest *(Quercus robur* and *Q. pyrenaica)* litter, 11. V. 1982. – Paratypes: 24 specimens from same locality and habitat as holotype.

Additional material.

Locality	Habitat	Alt.	U. T. M.	Date	N.
Bigüezal	Humus, P. sylvestris	1100	30TXN52	17. XI. 82	4
Erize, Atez val.	Litter, Larch grove	830	30TXN05	24. XI. 82	1
Quinto Real	Humus, grass land	850	30TXN26	1. VI. 82	1
Quinto Real	Humus, grass land	850	30TXN26	26. VIII. 82	1
Sansoain	Humus, Q. rotundifolia	650	30TXN12	22. II. 83	1
Sansoain	Humus, P. nigra	650	30TXN12	27. VII. 82	1
Juslapeña	Bush land	–	–	31. I. 86	1
Juslapeña (Marcalain)	Humus, 21 y. o. P. nigra	630	30TXN05	20. X. 86	6
Juslapeña (Beorburu)	Humus, 29 y. o. P. nigra	780	30TXN05	20. X. 86	1
Juslapeña (Ataburu)	Humus, 41 y. o. P. nigra	600	30TXN05	20. X. 86	6
Lónguida v. (Olaberri)	Humus, 18 y. o. P. nigra	610	30TXN34	3. XI. 86	5
Arce v. (Zazpe)	Humus, 32 y. o. P. nigra	620	30TXN34	3. XI. 86	13

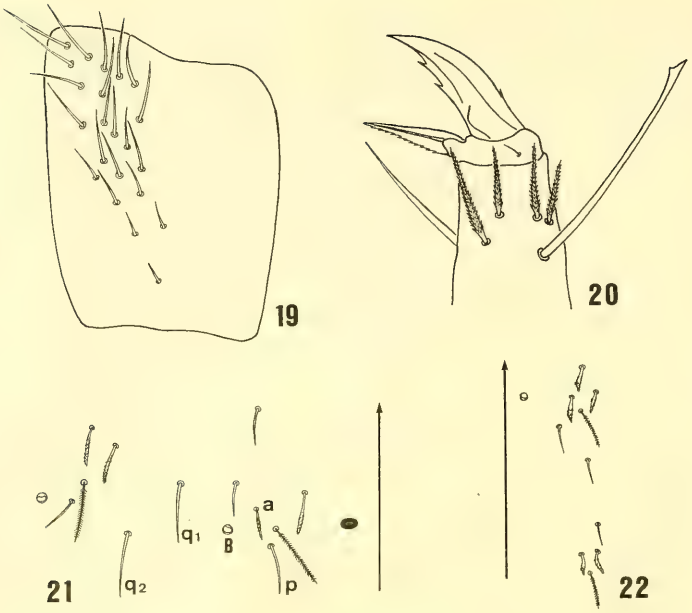
Esteríbar v. (Zabaldica)	Humus, 39 y. o. P. nigra	680	30TXN14	3. XI. 86	7
Lónguida v. (Itoiz)	Humus, 50 y. o. P. nigra	730	30TXN34	3. XI. 86	6
Lónguida v. (Jaberri)	Humus, 22 y. o. P. nigra	590	30TXN33	10. XI. 86	3
Lónguida (Meoz)	Humus, 47 y. o. P. nigra	635	30TXN33	10. XI. 86	5
Atez v. (Arostegui)	Humus, 33 y. o. P. nigra	550	30TXN05	11. VI. 86	1
Atez v. (Arostegui)	Humus, 33 y. o. P. nigra	550	30TXN05	13. X. 86	16
Atez v. (Berasain)	Humus, 38 y. o. P. nigra	655	30TXN05	13. X. 86	18
Iza-Gulina (Gulina)	Humus, 22 y. o. P. nigra	540	30TWN95	13. X. 86	15
Iza-Gulina (Cia)	Humus, 47 y. o. P. nigra	810	30TXN05	13. X. 86	8
Puente la Reina	Humus, 52 y. o. P. nigra	550	30TWN92	17. XI. 86	1
Ezprogui (Sabaiza)	Humus, 22 y. o. P. nigra	960	30TXN22	16. VI. 86	1
Aibar v. (Eslava)	Humus, 50 y. o. P. nigra	825	30TXN21	28. XI. 86	1
Aranguren	Humus, bush land	–	–	7. XI. 86	3



Figs 13–18. *Lepidocyrtus tellecheae,* spec. nov. 13. Habitus. 14. Labial chaetotaxy. 15. Setae along cephalic groove. 16. Distal area of labrum. 17. Maxilary palp. 18. Outer labial papilla.

Description

Length: 1.6–2.0 mm. Mesonotum projecting over the head. Body colour yellowy. Antenae; ocular patches; coxae; and frontal, lateral and ventral areas of the head are blue-purple (Fig. 13). Body covered with abundant scales. Antennal segments I and II, legs and furca with scales. 8 ocelli per side. Antennal segment IV without apical papilla. Relative length of antennal segments I/II/III/IV = 1/2/1.7/2.9. Antennae 1.3–1.6 times the head length. Labral chaetotaxy as in the other species of the genus (4/5, 5, 4). Prelabral setae ciliate. Labral setae smooth. Setae of third labral row subequal and sharpen-



Figs 19–22. *Lepidocyrtus tellecheae*, spec. nov. 19. Trochanteral organ. 20. Hind foot complex. 21. Chaetotaxy of the abdominal tergite II. 22. Chaetotaxy of the abdominal tergite IV.

ed (Fig. 16). Labral papillae subequal and weakly sharpened. All setae on labial basal line present and ciliate. Labial chaetotaxy: *a 1–5, M 1 M 2 R E L 1 L 2* (Fig. 14). Maxillary palp and outer labial papillae as in figure 17 and 18. 5 + 5 ciliate setae along cephalic groove (Fig. 15). Dorsal chaetotaxy of macrochaetae: R011/00/0101 + 3. Abdominal tergite II chaetotaxy: *p a B q 1 q 2* (Fig. 21). *s* seta on abdominal tergite IV absent (Fig. 22). Unguis with a pair of inner basal teeth originating near the middle of the claw, and an unpaired tooth inserted about 70% on the inner margin of the unguis (Fig. 20). Unguiculus lanceolate, outer lamella with several small denticles. Tibiotarsal tenent hair strongly clavate. Trochanteral organ with 20–25 setae forming triangular area. Mucro as in the genus. Tenaculum with 4 + 4 teeth and a seta on the corpus. Claw/mucro ratio between 1.5 to 1.7. Furca/body ratio = 1/1.9–2.2. Smooth/annulated parts of the dens = 1/4.5–5.5.

Affinities. *Lepidocyrtus tellecheae*, spec. nov. belongs to the *Lepidocyrtus lignorum* group from Gisin (1967), which belongs to the "Lepidosopoda" group from Hüther (1986) (legs and manubrium dorsally scaled; collar consists of one row of bristles; mesothorax normal, with a few more microchaetae in forepart; microchaeta d2 in the abdominal segment II is forwardly displaced).

Lepidocyrtus tellecheae, spec. nov. is closely related to *Lepidocyrtus lignorum*. Both species have the same chaetotaxy. The difference between them lies on the size and colour of *Lepidocyrtus tellecheae*, spec. nov., which is greater and more pigmented; and on the labial setae shape: 2–3 branches in *Lepidocyrtus lignorum* and smooth in *Lepidocyrtus tellecheae* spec. nov.

Derivatio nominis. We dedicate this species to Mrs. Ma. Socorro Tellechea, in acknowledge for her work on collembola in our laboratory.

Acknowledgements

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Summary

Three new species of the genus *Lepidocyrtus* and *Pseudosinella* are described from Navarra (Northern Iberian Peninsula). *Lepidocyrtus tellecheae,* spec. nov. relates to *Lepidocyrtus lignorum* Fabricius, 1775, but differs in colour pattern; greater size; and shape of the anterior labral setae. *Pseudosinella helenae,* spec. nov. has a macrochaeta formula R001/21/0201 + 2, and *Pseudosinella pseudodecepta,* spec. nov. has R011/20/0201 + 2. Both species have no eyes. They belong to the genealogical line of *Lepidocyrtus pallidus* Reuter, 1890 (seta *p* appears on abdominal tergite II, and labial seta *r* is vestigial).

Résumé

On fait la description de trois nouvelles espèces appartenant aux genres *Lepidocyrtus* et *Pseudosinella,* et trouvées dans la Navarre (Nord de la Péninsule Ibérique). *Lepidocyrtus tellecheae,* spec. nov. se rapproche de *Lepidocyrtus lignorum* Fabricius, 1775, mais il en est bien distincte par sa coloration, une plus grande taille et la morphologie des soies antérieures du labre. *Pseudosinella helenae,* spec. nov. présente comme formule des macrochétes dorsaux R001/21/0201 + 2, et *Pseudosinella pseudodecepta,* spec. nov. R011/20/0201 + 2. Ni l'une ni l'autre n'ont de yeux, et elles appartiennent à la lignée généalogique de *Lepidocyrtus pallidus* Reuter, 1890 (la soie *p* est présente sur le tergite abdominal II et la soie labial *r* est extrémement réduite).

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